What is claimed is:

1. An interference canceller apparatus that eliminates
interference from an other user by generating an
5   interference replica of the other user and subtracting
the interference replica from a received signal,
comprising:

  hard deciding means for carrying out a hard decision
on a signal after performing error correcting decoding
10   on the received signal;

  error detecting means for carrying out error
detection on a signal after the hard decision; and

  replica generating means for generating, when the
error detection result shows that the signal after the
15   hard decision is erroneous, the replica using a weighting
factor to reduce the replica.

2. An interference canceller apparatus that eliminates
interference from an other user by generating an
20   interference replica of the other user and subtracting
the interference replica from a received signal,
comprising:

  first hard deciding means for carrying out a hard
decision on a signal after performing error correcting
25   decoding on the received signal;

  second hard deciding means for carrying out a hard
decision on a signal before performing error correcting
decoding on the received signal;

error detecting means for carrying out error
detection on a signal after the first hard decision; and

replica generating means for generating, when the
error detection result shows that the signal after the

5   first hard decision is erroneous, the replica using a
signal after the second hard decision.

3. An interference canceller apparatus according to claim
2, wherein said replica generating means generates, when

10   the error detection result shows that the signal after
the first hard decision is errorless, the replica using
a signal obtained by carrying out error correcting coding
on the signal after the first hard decision.

15   4. An interference canceller apparatus that eliminates
interference from an other user by generating an
interference replica of the other user and subtracting
the interference replica from a received signal,
comprising:

20   hard deciding means for carrying out a hard decision
on a signal after performing error correcting decoding
on the received signal;

         soft deciding means for carrying out a soft decision
on a signal before performing error correcting decoding

25   on the received signal;

         error detecting means for carrying out error
detection on a signal after the hard decision; and

         replica generating means for generating, when the

error detection result shows that the signal after the hard decision is erroneous, the replica using a signal after the soft decision.

5   5. An interference canceller apparatus according to claim 4, wherein said replica generating means generates, when the error detection result shows that the signal after the hard decision is errorless, the replica using a signal obtained by carrying out error correcting coding on the
10   signal after the hard decision.

6. An interference canceller apparatus provided with a plurality of stages each for generating an interference replica of an other user and subtracting the interference
15   replica from a received signal, with at least one stage except the final stage having an interference canceller unit, the interference canceller unit, comprising:

first hard deciding means for carrying out a hard decision on a signal after performing error correcting
20   decoding on the received signal;

second hard deciding means for carrying out a hard decision on a signal before performing error correcting decoding on the received signal;

error detecting means for carrying out error
25   detection on a signal after the first hard decision;

selecting means for selecting a most suitable signal to be used for replica generation from among a signal obtained by carrying out error correcting coding on the

signal after the first hard decision in the own stage, a signal obtained by carrying out error correcting coding on the signal after the first hard decision in the previous stage, and a signal after the second hard decision in

5   the own stage, based on the error detection result of the own stage and the error detection result of the previous stage; and

replica generating means for generating the replica using the selected signal.

10

7. An interference canceller apparatus according to claim 6, wherein said selecting means selects, when the error detection result in the previous stage shows that the signal after the first hard decision in the previous stage

15   is errorless, the signal obtained by carrying out error correcting coding on the signal after the first hard decision in the previous stage.

8. An interference canceller apparatus according to claim

20   6, wherein said selecting means selects, when the error detection result in the previous stage shows that the signal after the first hard decision in the previous stage is erroneous and the error detection result in the own stage shows that the signal after the first hard decision

25   in the own stage is errorless, the signal obtained by carrying out error correcting coding on the signal after the first hard decision in the own stage.

9. An interference canceller apparatus according to claim
6, wherein said selecting means selects, when the error
detection result in the previous stage shows that the
signal after the first hard decision in the previous stage

5   is erroneous and the error detection result in the own
stage shows that the signal after the first hard decision
in the own stage is erroneous, the signal after the second
hard decision in the own stage.

10   10. An interference canceller apparatus according to
claim 6, wherein the final stage has a second interference
canceller unit, the second interference canceller unit,
comprising:
        said first hard deciding means for carrying out a
15   hard decision on a signal after performing error
correcting decoding on the received signal;
        second selecting means for selecting a signal to
be used for output from among the signal after the first
hard decision in the own stage and the signal after the
20   first hard decision in the previous stage, based on the
error detection result of the previous stage; and
        outputting means for outputting the selected
signal.

25   11. An interference canceller apparatus according to
claim 10, wherein said second selecting means selects,
when the error detection result in the previous stage
shows that the signal after the first hard decision in

the previous stage is errorless, the signal after the
first hard decision in the previous stage.

12. An interference canceller apparatus according to
5   claim 10, wherein said second selecting means selects,
when the error detection result in the previous stage
shows that the signal after the first hard decision in
the previous stage is erroneous, the signal after the
first hard decision in the own stage.

10

13. An interference canceller apparatus provided with
a plurality of stages each for generating an interference
replica of an other user and subtracting the interference
replica from a received signal, with at least one stage
15   except the final stage having an interference canceller
unit, the interference canceller unit, comprising:

    hard deciding means for carrying out a hard decision
on a signal after performing error correcting decoding
on the received signal;

20   soft deciding means for carrying out a soft decision
on a signal before performing error correcting decoding
on the received signal;

    error detecting means for carrying out error
detection on a signal after the hard decision;

25   selecting means for selecting a most suitable signal
to be used for replica generation from among a signal
obtained by carrying out error correcting coding on the
signal after the hard decision in the own stage, a signal

obtained by carrying out error correcting coding on the
signal after the hard decision in the previous stage,
and a signal after the soft decision in the own stage,
based on the error detection result of the own stage and

5   the error detection result of the previous stage; and
        replica generating means for generating the replica
using the selected signal.

14. An interference canceller apparatus according to
10   claim 13, wherein said selecting means selects, when the
error detection result in the previous stage shows that
the signal after the hard decision in the previous stage
is errorless, the signal obtained by carrying out error
correcting coding on the signal after the hard decision
15   in the previous stage.

15. An interference canceller apparatus according to
claim 13, wherein said selecting means selects, when the
error detection result in the previous stage shows that
20   the signal after the hard decision in the previous stage
is erroneous and the error detection result in the own
stage shows that the signal after the hard decision in
the own stage is errorless, the signal obtained by carrying
out error correcting coding on the signal after the hard
25   decision in the own stage.

16. An interference canceller apparatus according to
claim 13, wherein said selecting means selects, when the

error detection result in the previous stage shows that the signal after the hard decision in the previous stage is erroneous and the error detection result in the own stage shows that the signal after the hard decision in

5   the own stage is erroneous, the signal after the soft decision in the own stage.

17. An interference canceller apparatus according to claim 13, wherein the final stage has a second interference

10   canceller unit, the second interference canceller unit, comprising:

said hard deciding means for carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

15   second selecting means for selecting a signal to be used for output from among the signal after the hard decision in the own stage and the signal after the hard decision in the previous stage, based on the error detection result of the previous stage; and

20   outputting means for outputting the selected signal.

18. An interference canceller apparatus according to claim 17, wherein said second selecting means selects,

25   when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is errorless, the signal after the hard decision in the previous stage.

19. An interference canceller apparatus according to claim 17, wherein said second selecting means selects, when the error detection result in the previous stage

5   shows that the signal after the hard decision in the previous stage is erroneous, the signal after the hard decision in the own stage.

20. A base station apparatus equipped with the

10   interference canceller apparatus according to any one of claim 1 to claim 19.

21. A mobile station apparatus equipped with the interference canceller apparatus according to any one

15   of claim 1 to claim 19.

22. An interference elimination method for eliminating interference from an other user by generating an interference replica of the other user and subtracting

20   the interference replica from a received signal, comprising:

a hard deciding step of carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

25   an error detecting step of carrying out error detection on a signal after the hard decision; and

a replica generating step of generating, when the error detection result shows that the signal after the

hard decision is erroneous, the replica using a weighting factor to reduce the replica.

23. An interference elimination method for eliminating interference from an other user by generating an interference replica of the other user and subtracting the interference replica from a received signal, comprising:

a first hard deciding step of carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

an error detecting step of carrying out error detection on a signal after the first hard decision; and

a replica generating step of generating, when the error detection result shows that the signal after the first hard decision is erroneous, the replica using a signal obtained by carrying out a hard decision on a signal before performing error correcting decoding on the received signal.

24. An interference elimination method according to claim 23, wherein said replica generating step generates, when the error detection result shows that the signal after the first hard decision is errorless, the replica using a signal obtained by carrying out error correcting coding on the signal after the first hard decision.

25. An interference elimination method for eliminating

interference from an other user by generating an
interference replica of the other user and subtracting
the interference replica from a received signal,
comprising:

5   a hard deciding step of carrying out a hard decision
on a signal after performing error correcting decoding
on the received signal;

an error detecting step of carrying out error
detection on a signal after the hard decision; and

10   a replica generating step of generating, when the
error detection result shows that the signal after the
hard decision is erroneous, the replica using a signal
obtained by carrying out a soft decision on a signal before
performing error correcting decoding on the received

15   signal.

26. An interference elimination method according to claim
25, wherein said replica generating step generates, when
the error detection result shows that the signal after

20   the hard decision is errorless, the replica using a signal
obtained by carrying out error correcting coding on the
signal after the hard decision.

27. An interference elimination method for an

25   interference canceller apparatus provided with a
plurality of stages each for generating an interference
replica of an other user and subtracting the interference
replica from a received signal, whose at least one stage

except the final stage, comprising:

a first hard deciding step of carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

5   a second hard deciding step of carrying out a hard decision on a signal before performing error correcting decoding on the received signal;

an error detecting step of carrying out error detection on a signal after the first hard decision;

10   a selecting step of selecting a most suitable signal to be used for replica generation from among a signal obtained by carrying out error correcting coding on the signal after the first hard decision in the own stage, a signal obtained by carrying out error correcting coding

15   on the signal after the first hard decision in the previous stage, and a signal after the second hard decision in the own stage, based on the error detection result of the own stage and the error detection result of the previous stage; and

20   a replica generating step of generating the replica using the selected signal.

28. An interference elimination method according to claim 27, wherein said selecting step selects, when the error

25   detection result in the previous stage shows that the signal after the first hard decision in the previous stage is errorless, the signal obtained by carrying out error correcting coding on the signal after the first hard

decision in the previous stage.

29. An interference elimination method according to claim 27, wherein said selecting step selects, when the error detection result in the previous stage shows that the signal after the first hard decision in the previous stage is erroneous and the error detection result in the own stage shows that the signal after the first hard decision in the own stage is errorless, the signal obtained by carrying out error correcting coding on the signal after the first hard decision in the own stage.

30. An interference elimination method according to claim 27, wherein said selecting step selects, when the error detection result in the previous stage shows that the signal after the first hard decision in the previous stage is erroneous and the error detection result in the own stage shows that the signal after the first hard decision in the own stage is erroneous, a signal obtained by carrying out error correcting coding on the signal after the second hard decision in the own stage.

31. An interference elimination method according to claim 27, whose final stage, comprising:
    said first hard deciding step of carrying out a hard decision on a signal after performing error correcting decoding on the received signal;
    a second selecting step of selecting a signal to

be used for output from among the signal after the first
hard decision in the own stage and the signal after the
first hard decision in the previous stage, based on the
error detection result of the previous stage; and

5   an outputting step of outputting the selected
signal.

32. An interference elimination method according to claim
31, wherein said second selecting step selects, when the
10   error detection result in the previous stage shows that
the signal after the first hard decision in the previous
stage is errorless, the signal after the first hard
decision in the previous stage.

15   33. An interference elimination method according to claim
31, wherein said second selecting step selects, when the
error detection result in the previous stage shows that
the signal after the first hard decision in the previous
stage is erroneous, the signal after the first hard
20   decision in the own stage.

34. An interference elimination method for an
interference canceller apparatus provided with a
plurality of stages each for generating an interference
25   replica of an other user and subtracting the interference
replica from a received signal, whose at least one stage
except the final stage, comprising:
          a hard deciding step of carrying out a hard decision

on a signal after performing error correcting decoding
on the received signal;

   a soft deciding step of carrying out a soft decision
on a signal before performing error correcting decoding
5   on the received signal;

   an error detecting step of carrying out error
detection on a signal after the hard decision;

   a selecting step of selecting a most suitable signal
to be used for replica generation from among a signal
10   obtained by carrying out error correcting coding on the
signal after the hard decision in the own stage, a signal
obtained by carrying out error correcting coding on the
signal after the hard decision in the previous stage,
and a signal after the soft decision in the own stage,
15   based on the error detection result of the own stage and
the error detection result of the previous stage; and

   a replica generating step of generating the replica
using the selected signal.

20   35. An interference elimination method according to claim
34, wherein said selecting step selects, when the error
detection result in the previous stage shows that the
signal after the hard decision in the previous stage is
errorless, the signal obtained by carrying out error
25   correcting coding on the signal after the hard decision
in the previous stage.

36. An interference elimination method according to claim

34, wherein said selecting step selects, when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is erroneous and the error detection result in the own stage

5   shows that the signal after the hard decision in the own stage is errorless, the signal obtained by carrying out error correcting coding on the signal after the hard decision in the own stage.

10   37. An interference elimination method according to claim 34, wherein said selecting step selects, when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is erroneous and the error detection result in the own stage

15   shows that the signal after the hard decision in the own stage is erroneous, the signal after the soft decision in the own stage.

    38. An interference elimination method according to claim

20   34, whose final stage, comprising:

    said hard deciding step of carrying out a hard decision on a signal after performing error correcting decoding on the received signal;

    a second selecting step of selecting a signal to

25   be used for output from among the signal after the first hard decision in the own stage and the signal after the hard decision in the previous stage, based on the error detection result of the previous stage; and

an outputting step of outputting the selected signal.

39. An interference elimination method according to claim 38, wherein said second selecting step selects, when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is errorless, the signal after the hard decision in the previous stage.

40. An interference elimination method according to claim 38, wherein said second selecting step selects, when the error detection result in the previous stage shows that the signal after the hard decision in the previous stage is erroneous, the signal after the hard decision in the own stage.